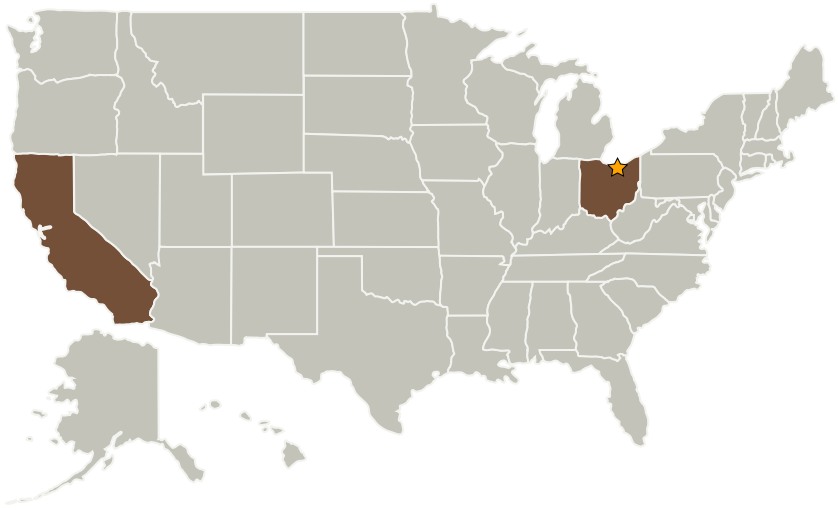
Novel Materials that Enhance Efficiency and Radiation Resistance of Solar Cells, Phase II

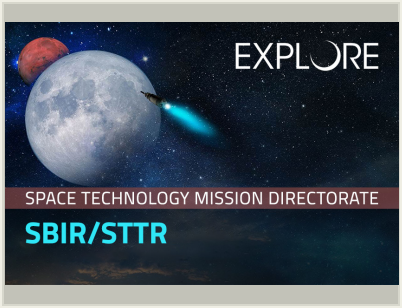
Completed Technology Project (2009 - 2011)

Project Introduction

Spacecrafts rely on arrays of solar cells to generate electrical power. It is an on-going challenge to maximize electrical power available to spacecraft while reducing overall stowage volume and mass of solar array, which requires developing more efficient solar cells with higher specific power density. The objective of this SBIR project is to develop a generic approach, based on novel functional nano-materials, to significantly increasing the solar cell efficiency (~10%), specific power density, radiation resistance and lifetime, without adding much cost or weight to the existing solar cells. The feasibility to synthesis such nano-materials has been explored and demonstrated in Phase I. Without optimizing, preliminary test on commercial solar cells show an efficiency gain approaching 5% after applying such nano-materials. Such nano-materials will be further improved for energy efficiency and environmental durability in Phase II, to reach the objective of at least 10% gain in energy efficiency on majority of commercial solar cells.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Sun Innovations, Inc.	Supporting Organization	Industry Minority-Owned Business	Fremont, California

Primary U.S. Work Locations	
California	Ohio

Project Transitions

March 2009: Project Start

March 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.1 Photovoltaic